

REMARKS

Claims 1 to 18 are pending.

The Applicants gratefully acknowledge the Patent Office removal of "Final" status from the Office Action dated November 23, 2005 and the withdrawal of the Office Action dated November 23, 2005; and the issuance of a Non-Final Office Action dated January 31, 2006, establishing a three-month shortened statutory period for reply.

The Office Action dated January 31, 2006 included a summary of the independent claims at ¶ 4 (bridging pages 3 and 4). Included in that statement, the Patent Office asserted that:

"Parent Claim 15 relates to Claim 1 using two specified monomers in component (a) and without the limitation of using mineral filler..." (emphasis in original).

The Applicants respectfully draw attention to component (c) of claim 15, which provides:

" (c) a peroxide curable component *comprising at least one mineral filler*, such that upon vulcanization the resulting compound has a retraction at lower temperature (TR-10) of -20°C or less; and" (emphasis added).

It is unclear why the Patent Office characterizes claim 15 as being without the limitation of using a mineral filler. Appropriate written restatement of the claim construction by the Patent Office is hereby respectfully requested with respect to claim 15.

§ 103 Rejections*Paglia in view of Araki*

Claims 1–18 stand rejected under 35 USC § 103(a) as being unpatentable over Paglia et al. (U.S. 6,506,460) [hereinafter Paglia] in view of Araki et al. (U.S. 6,706,819) [hereinafter Araki].

The Patent Office asserts that crosslinking reactions including slow and rapid routes are disclosed or suggested by Paglia. The Patent Office further asserts that while Paglia's disclosure

indicates that UV curing systems at room temperature are preferred, in the Patent Office's words other systems "such as homolytic or heterolytic heat-induced decomposition of peroxide compound may be still workable" even though Paglia "may have found that it may cause some trouble".

The Applicants respectfully submit that the Patent Office characterization of Paglia is not accurate. At column 19, lines 12 to 32, Paglia discusses the use of UV curing. Paglia specifically addresses the use of peroxide cure systems, saying "heterolytic cure systems, which rely on thermally-induced crosslinking reactions, are not appropriate for the present process. In addition, the most common homolytic, i.e. free radical, curing processes, which depend on thermal decomposition of peroxides, are also *unsuitable for use in the present process.*"

The MPEP clearly directs that "a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention." MPEP § 2143.02 (VI). In fact, the MPEP illustrates this point by citing *W.L. Gore & Associates, Inc. v. Garlock Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). The MPEP, in discussing *Gore*, observe that, in *Gore*, the claims "were directed to a process of producing a porous article by expanding shaped, unsintered, highly crystalline poly(tetrafluoroethylene) (PTFE) by stretching said PTFE at a 10% per second rate to more than five times the original length. The prior art teachings with regard to unsintered PTFE indicated the material does not respond to conventional plastics processing, and the material should be stretched slowly. A reference teaching rapid stretching of conventional plastic polypropylene with reduced crystallinity combined with a reference teaching stretching unsintered PTFE would not suggest rapid stretching of highly crystalline PTFE, in light of the disclosures in the art that teach away from the invention, i.e., that the conventional polypropylene should have reduced crystallinity before stretching, and that PTFE should be stretched slowly."

The present rejection claimed invention presents material similarities to the decision in *Gore*. The prior art here teaches that the compositions described therein (Paglia) must be cured slowly, and that other cure systems are impracticable because they are difficult to control and can lead to pre-mature gelling (i.e. scorch). The Patent Office has made an unsupported assertion that

fast curing may be desirable, and that combining the fast curing option with the description of materials in Paglia renders the claimed invention obvious.

This combination, however, is inappropriate. Just as in *Gore*, the Patent Office assertion that fast cure may sometimes be desirable, combined with the teaching in Paglia that such fast curing techniques are "unsuitable" does not suggest the presently claimed invention.

The Applicants respectfully submit maintenance of the rejection of amended claims 1-18 under 35 USC § 103(a) based on Paglia in view of Araki is inappropriate. Accordingly, Applicants request that this rejection be withdrawn.

Brinati in view of Araki

Claims 1-18 stand rejected under 35 USC § 103(a) as being unpatentable over Brinati in view of Araki.

Applicants respectfully submit that Claims 1-18 are patentable over Brinati in view of Araki. Brinati discloses terpolymer fluoroelastomers of vinylidene fluoride, hexafluoropropene and tetrafluoroethylene, wherein the polymers have repeating units derived from specific weight percent compositions of each monomer.

The Patent Office admits that Brinati provides only for a bisphenol-onium cure system. The Patent Office has not shown where Brinati teaches, suggests or describes using a peroxide compound for curing. Indeed, the polymers of Brinati do not contain any cure site monomer, also as admitted by the Patent Office. Thus, the polymers of Brinati are not capable of peroxide curing.

The Patent Office has also not shown where Araki teaches, suggests or describes an elastomeric copolymer having interpolymerized monomeric units derived from vinylidene fluoride monomer (it shows only TFE/PMVE copolymers, TFE/PPVE copolymers, PFA, and FEP). Araki also fails to teach, suggest or describe elastomeric copolymers having substantially no perfluorinated vinyl ether monomers (all of the described elastomeric polymers contain PMVE, PPVE, or some other perfluorinated vinyl ether monomer).

With Araki failing to teach the elastomeric copolymers of the present invention, the Patent Office has failed to establish a motivation present in the teachings of the prior art for

modifying the disclosure of Brinati to selectively incorporate only the cure site monomers of Araki and to otherwise ignore the other teachings of Araki, including the use of perfluorinated vinyl ether monomers in its elastomeric copolymer systems.

“The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the modification.” See MPEP § 2143.01 (citing *In re Mills*, 916 F.2d 680, 16 USPQ 1430 (Fed Cir. 1990)).

As raised by the Applicants in their RCE filed September 28, 2005, Araki discusses incorporation of cure site monomers in the context of preparing a polymer blend of a multi-segment fluoropolymer and a fluorine-containing resin having a crystalline melting point or glass transition temperature of less than 150°C. See Araki, Claim 1. Such a polymer blend is incapable of meeting the limitation of amended Claims 1 and 15. Therefore, a pure combination of Araki with Brinati would fail to produce the claimed compound. To overcome this, the Patent Office selectively chooses which aspects of Araki to combine with Brinati. The Patent Office fails to account, however, for how Araki would suggest to one of ordinary skill in the art that it is desirable to ignore the teachings of the particular polymer blend described therein and select only the aspect of Araki directed to cure site monomers, and then to combine only this limited aspect with the description in Brinati.

Second, the Patent Office has not shown where Brinati itself provides motivation to modify its teachings to provide a peroxide curable fluoropolymer, a peroxide, and mineral fillers as opposed to the peroxide non-curable fluoropolymers, the bisphenol-onium cure system and carbon black fillers described therein. The Patent Office asserts that desirable physical properties may be expected when combining the cure site monomers of Araki with the polymers of Brinati. But in order to arrive at the present claims, the Patent Office must show more than an expectation of desirable physical properties. The Patent Office must show motivation in Brinati to modify its polymer as described in claim 1 of the present application, to modify its cure system as described in claim 1 of the present application, to modify its fillers as described in claim 1 of the present application, to select only that aspect of Araki directed toward peroxide curable cure site monomers, and to disregard the teachings of Araki directed toward the polymer blends and perfluoro vinyl ether containing monomers described therein. The Patent Office has made no

such showing. The Patent Office has gone far beyond the descriptions of the prior art to provide motivation for this combination.

The Patent Office has not shown where motivation exists in the prior art to selectively modify Brinati in view of particular provisions in Araki, while ignoring other provisions of Araki. When the Patent Office fails to show where the prior art itself provides a motivation to combine or modify references to give the present claims, it fails to establish a prima facie case of obviousness.

Even if the Patent Office could present a prima facie case of obviousness, obviousness may be rebutted by evidence “that the claimed invention yields unexpectedly improved properties or properties not present in the prior art. A showing of unexpected results must be based on evidence, not argument or speculation.” See MPEP § 2144.08 (citations omitted).

In this case, the Applicants have provided evidence rebutting the Patent Office assertion of obviousness. See Paper #11 (RCE and Amendment filed September 28, 2005). Applicants have shown, in direct comparison of data, the unexpected benefits of the present claims over the prior art. This showing is based on the evidence provided in the comparison between the present application and the descriptions provided in the prior art.

Particularly, the Applicants have shown that when Example 3 of Brinati is compared with Example 4 of the present application, the Tg, and the calculated monomer weight and mole ratios are similar. See Comparison Table provided below. Despite some compositional similarity of the fluoropolymers, however, the TR10 of the two compositions are significantly different. These surprising and substantial improvements are observed when comparing Example 3 from Brinati which uses a bisphenol-onium cure system and carbon black filler with the present claims which are directed to a combination of a peroxide cure and a mineral filler.

Comparison Table

	<u>Example 3 in Brinati</u>	<u>Example 4 in the Present Application</u>
<u>Polymer Components</u>		
<u>wt% (mol %)</u>		
Vinylidene Fluoride	59.5 (75.0)	60.6 (75.3)
Hexafluoropropylene	28.6 (15.4)	27.0 (14.3)
Tetrafluoroethylene	11.9 (9.6)	12.4 (9.9)
<u>Temperature Properties</u>		
Tg (°C)	- 25.4	-24
TR10 (°C)	-18	-24

In reference to this showing, the Patent Office asserts that Brinati has disclosed fluoroelastomers containing no perfluorinated vinyl ether monomer that have a low Tg and a low compression set at low temperature, which the Patent Office states is "equivalent to TR 10". The Patent Office does not cite a reference for the assertion that this property is indeed equivalent to TR 10 (claimed in claims 1 and 15).

The Applicants respectfully submit that the Patent Office has mischaracterized the value and property of TR 10. A low compression set at low temperature is NOT equivalent to TR 10. ASTM D 1329-02 (included with this response) states that TR 70 correlates with low-temperature compression set, but TR 10 has been found to correlate more closely with brittle points in vulcanizates based on polymers of a similar type. See ASTM D 1329-02, page 1 section 4.2 and 4.3.

Furthermore, glass transition temperature ("Tg") is also NOT equivalent to TR10. Aerospace Information Report AIR 1387C ("Designing with Elastomers for Use at Low Temperatures, Near or Below Glass Transition") describes TR 10 and Tg data, which are different. See page 10 Figures 2-5. Generally, Tg is used to describe uncured materials and TR 10 is used to describe cured materials.

In the present application, the Applicants have shown that the selection of peroxide cure with mineral fillers can improve TR 10. The selection of other fillers, such as carbon black; or the use of cure systems other than peroxide cure, do not improve the TR 10.

The Applicants respectfully submit maintenance of the rejection of amended claims 1-18 under 35 USC 103(a) based on Brinati in view of Araki is inappropriate. Accordingly, Applicants request that this rejection be withdrawn.

CONCLUSION

In view of the above, it is submitted that the application is in condition for allowance. Reconsideration of the application is requested.

Allowance of claims 1-18, at an early date is solicited.

Respectfully submitted,

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Date

By: 

Brian E. Szymanski, Reg. No.: 39,523

Telephone No.: 651-737-9138

Office of Intellectual Property Counsel
3M Innovative Properties Company
Facsimile No.: 651-736-3833